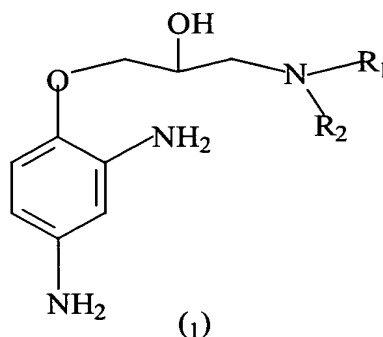


We Claim:

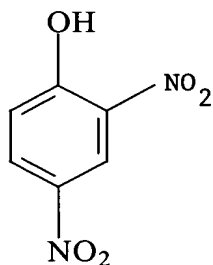
1. A compound of formula (1):



wherein  $R_1$ , and  $R_2$  are each individually selected from the group consisting of hydrogen atoms,  $C_1$  to  $C_5$  alkyl,  $C_1$  to  $C_5$  mono or dihydroxyalkyl, phenyl or benzyl optionally substituted with a hydroxyl, amino or  $C_1$  to  $C_3$  alkoxy group, or  $R_1$  and  $R_2$  together with the nitrogen atom to which they are attached form a  $C_3$  to  $C_6$  saturated or unsaturated ring optionally containing in the ring one or more additional hetero atoms selected from O, S and N atoms.

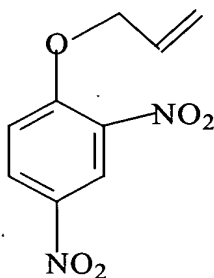
2. A compound of Claim 1 wherein  $R_1$  and  $R_2$  are each individually selected from the group consisting of hydrogen atom, a  $C_1$  to  $C_3$  alkyl group, phenyl or benzyl optionally substituted with an alkoxy group, or  $R_1$  and  $R_2$  together with the nitrogen atom to which they are bound form a piperazine, piperidine, imidazole, or morpholine ring.
3. A compound of Claim 2 wherein  $R_1$  is hydrogen and  $R_2$  is methoxyphenyl.
4. A compound of Claim 2 wherein  $R_1$  and  $R_2$  together with the nitrogen atom to which they are attached form a piperidine ring.
5. A compound of Claim 2 wherein  $R_1$  is hydrogen and  $R_2$  is methyl.
6. A compound of Claim 2 wherein  $R_1$  and  $R_2$  are both methyl.

7. A process for the preparation of a compound of formula (1) of Claim 1 comprising (a) reacting an dinitrophenol of the formula (2):



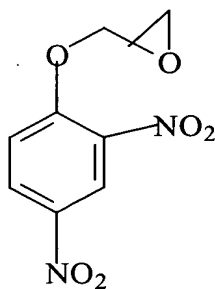
(2)

with an allyl halide and potassium carbonate to produce an allyl ether of formula (3):



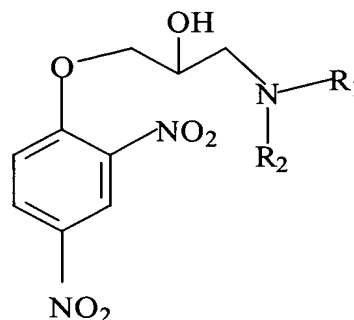
(3)

- (b) epoxidating the allyl ether compound with m-chlorobenzoic acid to produce a compound of formula (4)



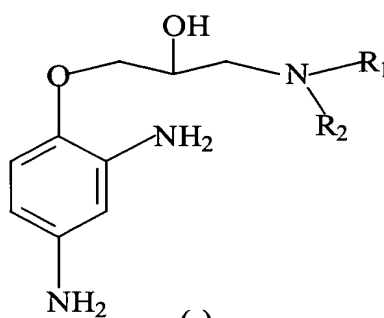
(4)

- (c) reacting the epoxide compound of formula (4) with a reagent of the formula (NR<sub>1</sub>R<sub>2</sub>) to produce a compound of formula (5)



(5)

and (d) subjecting the compound of formula (5) to catalytic hydrogenation to produce a compound of formula (1)



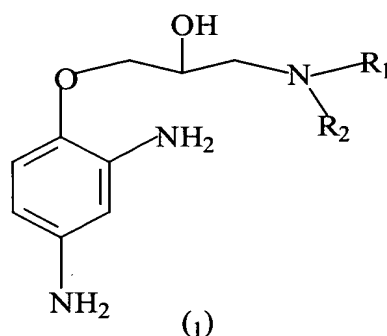
(1)

wherein  $\text{R}_1$  and  $\text{R}_2$  are as defined in Claim 1.

8. A process according to Claim 7 wherein  $\text{R}_1$  and  $\text{R}_2$  are each individually selected from the group consisting of hydrogen atom, a  $\text{C}_1$  to  $\text{C}_3$  alkyl group, phenyl or benzyl optionally substituted with an alkoxy group, or  $\text{R}_1$  and  $\text{R}_2$  together with the nitrogen atom to which they are bound form a piperazine, piperidine, imidazole, imidazoline, pyridine, or morpholine ring.

9. A process according to Claim 7 wherein  $\text{R}_1$  is hydrogen and  $\text{R}_2$  is methoxyphenyl.

10. A process according to Claim 7 wherein  $R_1$  and  $R_2$  form a piperidine ring.
11. A process according to Claim 7 wherein  $R_1$  is hydrogen and  $R_2$  is methyl.
12. A hair dye product comprising a hair dyeing composition containing at least one primary intermediate and at least one coupler and a developer composition containing one or more oxidizing agents, the hair dyeing composition containing a coupler of formula (1):



wherein  $R_1$  and  $R_2$  are each individually selected from the group consisting of hydrogen atoms,  $C_1$  to  $C_5$  alkyl,  $C_1$  to  $C_5$  mono or dihydroxyalkyl, phenyl or benzyl optionally substituted with a hydroxyl, amino or  $C_1$  to  $C_3$  alkoxy group, or  $R_1$  and  $R_2$  together with the nitrogen atom to which they are attached form a  $C_3$  to  $C_6$  saturated or unsaturated ring optionally containing in the ring one or more additional hetero atoms selected from O, S and N atoms.

13. A hair dye product according to Claim 12 wherein the hair dyeing composition additionally contains a coupler is selected from the group consisting of: benzene-1,3-diol, 4-chlorobenzene-1,3-diol, naphthalen-1-ol, 2-methylnaphthalen-1-ol, 2-methylbenzene-1,3-diol, 2-(2,4-diaminophenoxy)ethanol, 2-(3-amino-4-methoxyphenylamino)ethanol, 2-[2,4-diamino-5-(2-hydroxyethoxy)phenoxy]ethanol, and 3-(2,4-diaminophenoxy)propan-1-ol, 3-amino-phenol, 5-amino-2-methyl-phenol, 5-(2-hydroxyethylamino)-2-methyl-phenol, 3-amino-2-

methyl-phenol, 3,4-dihydro-2H-1,4-benzoxazin-6-ol, 4-methyl-2-phenyl-2,4-dihydro-3H-pyrazol-3-one, 1H-indol-6-ol, and 2-aminopyridin-3-ol.

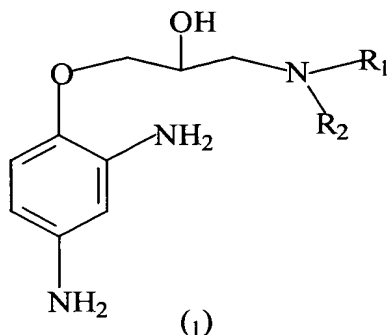
14. A hair dye product according to Claim 12 wherein the primary intermediate is selected from the group consisting of: 2-methyl-benzene-1,4-diamine, benzene-1,4-diamine, 2-(2,5-diamino-phenyl)-ethanol, 1-(2,5-diamino-phenyl)-ethanol, 2-[(4-amino-phenyl)-(2-hydroxy-ethyl)-amino]-ethanol, 4-amino-phenol, 4-methylamino-phenol, 4-amino-3-methyl-phenol, 1-(5-amino-2-hydroxy-phenyl)-ethane-1,2-diol, 2-amino-phenol, 2-amino-5-methyl-phenol, 2-amino-6-methyl-phenol, N-(4-amino-3-hydroxy-phenyl)-acetamide, pyrimidine-2,4,5,6-tetramine, 2-(4,5-diamino-1H-pyrazol-1-yl)ethanol, 1-(4-methylbenzyl)-1H-pyrazole-4,5-diamine, and 1-(benzyl)-1H-pyrazole-4,5-diamine.

15. A hair dye product according to Claim 14 wherein the hair dyeing composition additionally comprises a coupler selected from the group consisting of: benzene-1,3-diol, 4-chlorobenzene-1,3-diol, naphthalen-1-ol, 2-methylnaphthalen-1-ol, 2-methyl-benzene-1,3-diol, 2-(2,4-diamino-phenoxy)-ethanol, 2-(3-amino-4-methoxy-phenylamino)-ethanol, 2-[2,4-diamino-5-(2-hydroxy-ethoxy)-phenoxy]-ethanol, and 3-(2,4-diamino-phenoxy)-propan-1-ol, 3-amino-phenol, 5-amino-2-methyl-phenol, 5-(2-hydroxy-ethylamino)-2-methyl-phenol, 3-amino-2-methyl-phenol, 3,4-dihydro-2H-1,4-benzoxazin-6-ol, 4-methyl-2-phenyl-2,4-dihydro-3H-pyrazol-3-one, 1H-indol-6-ol, and 2-aminopyridin-3-ol.

16. A hair dye product according to Claim 12 wherein  $R_1$  and  $R_2$  are each individually selected from the group consisting of hydrogen atom, a  $C_1$  to  $C_3$  alkyl group, phenyl or benzyl optionally substituted with an alkoxy group, or  $R_1$  and  $R_2$  together with the nitrogen atom to which they are bound form a piperazine, piperidine, imidazole, or morpholine ring.

17. In a hair dyeing system wherein at least one primary intermediate is reacted with at least one coupler in the presence of an oxidizing agent to produce an

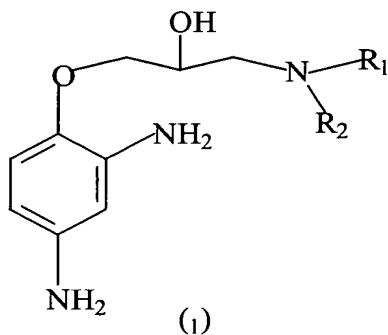
oxidative hair dye, the improvement wherein the at least one coupler comprises a compound of the formula (1):



wherein  $R_1$  and  $R_2$  are each individually selected from the group consisting of hydrogen atoms,  $C_1$  to  $C_5$  alkyl,  $C_1$  to  $C_5$  mono or dihydroxyalkyl, phenyl or benzyl optionally substituted with a hydroxyl, amino or  $C_1$  to  $C_3$  alkoxy group, or  $R_1$  and  $R_2$  together with the nitrogen atom to which they are attached form a  $C_3$  to  $C_6$  saturated or unsaturated ring optionally containing in the ring one or more additional hetero atoms selected from O, S and N atoms.

18. A hair dyeing composition comprising, in a suitable carrier or vehicle, an effective hair dyeing amount of:

- (a) at least one primary intermediate, and
- (b) at least one coupler comprising a compound of the formula (1):



wherein  $R_1$  and  $R_2$  are each individually selected from the group consisting of hydrogen atoms,  $C_1$  to  $C_5$  alkyl,  $C_1$  to  $C_5$  mono or dihydroxyalkyl, phenyl or benzyl optionally substituted with a hydroxyl, amino or  $C_1$  to  $C_3$  alkoxy group, or  $R_1$  and  $R_2$  together with the nitrogen atom to which they are attached form a  $C_3$  to  $C_6$  saturated or unsaturated ring optionally containing in the ring one or more additional hetero atoms selected from O, S and N atoms.

19. A hair dyeing composition according to Claim 18 wherein the hair dyeing composition additionally contains at least one coupler selected from the group consisting of: benzene-1,3-diol, 4-chlorobenzene-1,3-diol, naphthalen-1-ol, 2-methyl-naphthalen-1-ol, 2-methyl-benzene-1,3-diol, 2-(2,4-diamino-phenoxy)-ethanol, 2-(3-amino-4-methoxy-phenylamino)-ethanol, 2-[2,4-diamino-5-(2-hydroxy-ethoxy)-phenoxy]-ethanol, and 3-(2,4-diamino-phenoxy)-propan-1-ol, 3-amino-phenol, 5-amino-2-methyl-phenol, 5-(2-hydroxy-ethylamino)-2-methyl-phenol, 3-amino-2-methyl-phenol, 3,4-dihydro-2H-1,4-benzoxazin-6-ol, 4-methyl-2-phenyl-2,4-dihydro-3H-pyrazol-3-one, 1H-indol-6-ol, and 2-aminopyridin-3-ol.

20. A hair dyeing composition according to Claim 18 wherein the at least one primary intermediate is selected from the group consisting of: benzene-1,3-diol, 4-chlorobenzene-1,3-diol, naphthalen-1-ol, 2-methyl-naphthalen-1-ol, 2-methyl-benzene-1,3-diol, 2-(2,4-diamino-phenoxy)-ethanol, 2-(3-amino-4-methoxy-phenylamino)-ethanol, 2-[2,4-diamino-5-(2-hydroxy-ethoxy)-phenoxy]-ethanol, and 3-(2,4-diamino-phenoxy)-propan-1-ol, 3-amino-phenol, 5-amino-2-methyl-phenol, 5-(2-hydroxy-ethylamino)-2-methyl-phenol, 3-amino-2-methyl-phenol, 3,4-dihydro-2H-1,4-benzoxazin-6-ol, 4-methyl-2-phenyl-2,4-dihydro-3H-pyrazol-3-one, 1H-indol-6-ol, and 2-aminopyridin-3-ol.

21. A hair dyeing composition according to Claim 20 additionally comprising a coupler selected from the group consisting of: benzene-1,3-diol, 4-chlorobenzene-1,3-diol, naphthalen-1-ol, 2-methyl-naphthalen-1-ol, 2-methyl-benzene-1,3-diol, 2-

(2,4-diamino-phenoxy)-ethanol, 2-(3-amino-4-methoxy-phenylamino)-ethanol, 2-[2,4-diamino-5-(2-hydroxy-ethoxy)-phenoxy]-ethanol, and 3-(2,4-diamino-phenoxy)-propan-1-ol, 3-amino-phenol, 5-amino-2-methyl-phenol, 5-(2-hydroxy-ethylamino)-2-methyl-phenol, 3-amino-2-methyl-phenol, 3,4-dihydro-2H-1,4-benzoxazin-6-ol, 4-methyl-2-phenyl-2,4-dihydro-3H-pyrazol-3-one, 1H-indol-6-ol, and 2-aminopyridin-3-ol.

22. A hair dyeing composition of Claim 18 wherein  $R_1$  and  $R_2$  are each individually selected from the group consisting of hydrogen atom, a  $C_1$  to  $C_3$  alkyl group, phenyl or benzyl optionally substituted with an alkoxy group, or  $R_1$  and  $R_2$  together with the nitrogen atom to which they are bound form a piperazine, piperidine, imidazole, or morpholine ring.

23. A process for dyeing hair comprising forming a hair dye product composition by mixing a developer composition and a hair dyeing composition as defined in Claim 18, applying to the hair an amount of the hair dye product composition effective to dye the hair, permitting the hair dye product composition to contact the hair for period of time effective to dye the hair, and removing the hair dye product composition from the hair.

24. A process according to Claim 23 wherein  $R_1$  and  $R_2$  are each individually selected from the group consisting of hydrogen atom, a  $C_1$  to  $C_3$  alkyl group, phenyl or benzyl optionally substituted with an alkoxy group, or  $R_1$  and  $R_2$  together with the nitrogen atom to which they are bound form a piperazine, piperidine, imidazole, or morpholine ring.

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